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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/623,783

07/21/2003

Todd P. Oman

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05/11/2005

DELPHI TECHNOLOGIES, INC.

M/C 480-410-202

PO BOX 5052

TROY, MI 48007

EXAMINER

DATSKOVSKIY, MICHAEL V

ART UNIT

PAPER NUMBER

2835

DATE MAILED: 05/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

H:A

Office Action Summary**Application No.**

10/623,783

Applicant(s)

OMAN ET AL.

Examiner

Michael V. Datskovskiy

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>11/28/2003</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 5, 15 and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Goth et al.

Goth et al teach a thermally enhanced electronic module, Figs. 1-6, comprising: a thermally conductive case 19, a self-aligning thermally conductive heat sink 22, wherein the case 19 includes a concave pivot area with a first shape 24 formed into the case for receiving a first convex portion of the heat sink 22, and wherein the first portion of the heat sink has a second shape 33 that is complimentary to the first shape; and a die (chip) 27 with a first surface and a second surface 28 opposite the first surface, wherein the die is mounted to a substrate 15 with the first surface of the die facing the substrate, and wherein the second surface 28 of the die is in thermal contact with the heat sink 22. Regarding to the claims 15 and 18: The method steps are inherently necessitated by the device structure as it is shown by Goth et al.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 2-4, 6-8, 9-12, 13-14, 16-17 and 19-20 are rejected under 35 U.S.C.

103(a) as being unpatentable over Goth et al.

Regarding to the claim 8: Goth et al teach all the limitations of the claim except said electronic module is an automotive electronic module. It would be obvious to one ordinary skilled in the art at the time invention was made to use the device described by Goth et al in a car, since it has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. Ex parte Masham, 2 USPQ2d 1647 (1987).

Regarding to the claims 2, 7, 9, 14 and 20: Goth et al teach all the limitations of the claim except said substrate is a ceramic substrate (claims 2, 9) or is an aluminum oxide, or silicon nitride or a low temperature co-fired ceramic substrate (claims 7, 14 and 20). Official notes is taken that all these types of substrates are well known in the art, and. It would be obvious to one ordinary skilled in the art at the time invention was made to employ one of these materials to make a substrate, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of design choice. In re Leshin, 125 USPQ 416.

Regarding to the claims 6, 13 and 19: Goth et al teach all the limitations of the claim except said die (chip) includes at least one of a field effect transistors (FET), an

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insulated gate bipolar transistor (IGBT), a power flip chip and a power package. It would be obvious to one ordinary skilled in the art at the time invention was made to employ the cooling module described by Goth et al to comprise one of the listed above types of chips, since applicant has not disclosed that type of chips solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with any type of a heat generating die or chip.

5. Claims 3-4, 10-11 and 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goth et al in view of Tajima (JP362109347A).

Goth et al teach all the limitations of the claim except said module further including a thermally conductive film located between the die and the heat sink (claims 3, 10, 16), or one of thermally conductive grease and a thermally conductive adhesive (claims 4, 11 and 17) located between the case and the heat sink. Tajima teaches a thermally enhanced electronic module, Fig.1, comprising: a thermally conductive case 6, a self-aligning thermally conductive heat sink 3, wherein the case 6 includes a concave pivot area with a first shape formed into the part 4 of the case for receiving a first convex portion of the heat sink 3, and wherein the first portion of the heat sink has a second shape that is complimentary to the first shape; and a die (chip) 1 with a first surface and a second surface opposite the first surface, wherein the die is mounted to a substrate 2 with the first surface of the die facing the substrate, and wherein the second surface of the die is in thermal contact with the heat sink 3; and wherein a thermally conductive compound (grease) 9 is filled between the die 1 and the heat sink 3, and between the part 4 of the case 6 and the heat sink 3. Regarding to the specific material

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of said thermally conductive compound: Official notes is taken that all listed above types of claimed by the applicant thermally conductive materials are well known in the art, and it would be obvious to one ordinary skilled in the art at the time invention was made to employ one of these materials to fill a tolerance gaps in a thermal path of a cooling device by Goth et al, since it has been held to be within the general skill if a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of design choice. In re Leshin, 125 USPQ 416.

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Ostergren et al (US Patent 4,639,829); Morihara et al (US Patent 4,908,695); Yoshikawa et al (US Patent 6,046,498); Browne (US Patent 6,014,999); McLeod et al (US Patent 6,714,416); Abramov et al (SU 1798945 A1); Tajima (JP360046056A); The Article "Spherical Cooling Device" IBM Technical Disclosure Bulletin, July 1991, Volume 34, Issue 2, Pages 1-3; The Article "Swivel Piston Conduction Module" IBM Technical Disclosure Bulletin, December 1977, Volume 20, Issue 7, Pages 2707=2708; The Article "TCM With Short Thermal Path Through Piston to Wide Contact Area Between header and Piston" IBM Technical Disclosure Bulletin, July 1985, Volume 28, Issue 2, Pages 766-767; and The Article "Articulated Thermal Conductor for Semiconductor Packages" IBM Technical Disclosure Bulletin, January 1978, Volume 20, Issue 8, Pages 3131-3132.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael V. Datskovskiy whose telephone number is (571) 272-2040. The examiner can normally be reached on 8-4:30.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynn Feild can be reached on (571) 272-2092. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Michael V Datskovskiy
Primary Examiner
Art Unit 2835

05/10/2005